

WHAT IS CLAIMED IS:

1. An apparatus for improving soft ground, comprising:  
an injection rod (20) including an injection pipe (10)  
5 into which fluid is introduced, and an outer casing (12)  
disposed around the injection pipe (10) with an air feeding  
path (14) therebetween;

one or more injection holders (40) coupled to an outer  
surface of the outer casing (12) to be positioned at different  
10 levels and to be inclined downward; and

a bit (30) coupled to a lower end of the injection rod  
(20), and having jet holes (60, 60a), which are inclined  
downward and in which inclined jet nozzles (70, 70a) are  
inserted, and a cutting water nozzle (74) provided at its  
15 center.

2. The apparatus as set forth in claim 1, wherein the  
injection holders (40) are coupled to the injection pipe (1)  
and the outer casing (12) to be horizontally positioned.

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3. The apparatus as set forth in claim 1, wherein each of  
the injection holders (40) includes:

a tubular connecting holder (42) coupled to the injection  
pipe (10) through the outer casing (12);

25 a flange (46) disposed under a lower end of the connecting

holder (42) and having a plurality of air guide holes (44);  
a nozzle (50) fitted in the flange (46);  
a jet guide holder (90) having an upper space (52) in  
which the nozzle (50) fitted in the flange (46) is received,  
5 and a drain hole (56) having a diameter smaller than that of  
the space (52) and connected to the space (52), in which a snap  
ring (54) is partially embedded in an inner surface of the jet  
guide holder (90) to support an upper end of the flange (46),  
with a check rubber ring (84) disposed under the flange (46) in  
10 the space (52), and a support cap interposed between the flange  
(46) and the check rubber ring (84) to support the check rubber  
ring (84); and  
a protection pipe (96) threadedly coupled to the jet guide  
holder (90) at its one end and coupled to the outer casing (12)  
15 at the other end.

4. The apparatus as set forth in claim 2, further  
comprising a check packing (92) provided under the flange (46)  
in the space (52) of the jet guide holder (90).

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5. The apparatus as set forth in claim 2, wherein the  
nozzle (50) fitted in the flange (46) includes an arched  
concave surface (98) and an inclined surface (98a) at its upper  
end.

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